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SOIL CONSERVATION

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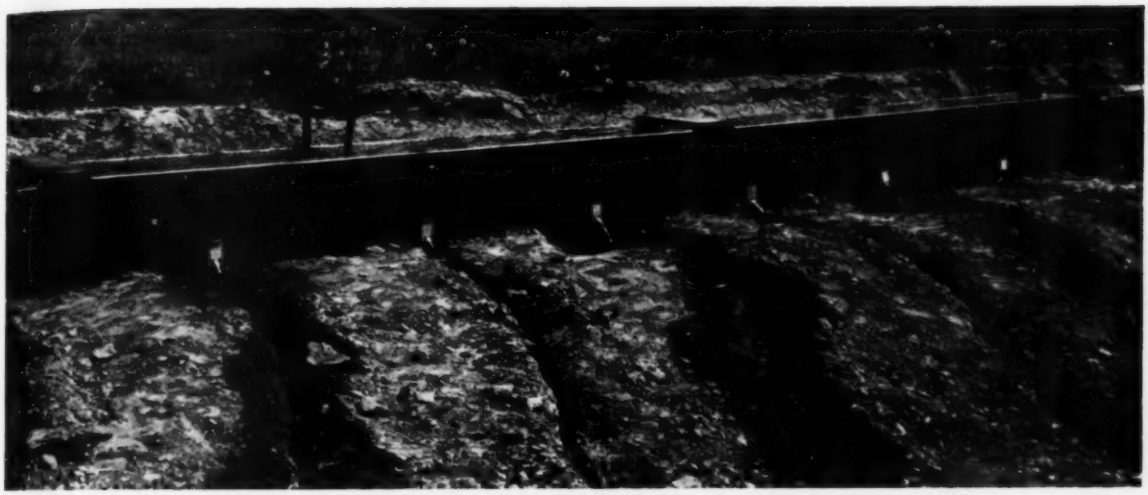

Control of the size of irrigation head permits adjustments for soil, slope, and cover conditions.

MORE FOOD FROM IMPROVED IRRIGATION

By D. A. WILLIAMS

IRRIGATION FARMERS from Mexico to Canada are concentrating on more food production: More than 150,000 farms with nearly eight and a half million acres under irrigation in Washington, Oregon, Idaho, California, and Nevada can produce more food and fiber. In the United States 90 percent of all sugar beets, 45 percent of all truck crops, 45 percent of all rice, and about 25 percent of all tomatoes are produced under irrigation. More than one-half the lambs fattened in the United States are on irrigated farms. About one-half of the irrigated lands produce one-half of all feed used in the livestock industry in the west. Produce more? Yes, every acre conscripted to its highest potential use and properly watered from the resource of available supply will produce more!

EDITOR'S NOTE.—The author is irrigation engineer, regional engineering division, Soil Conservation Service, Portland, Oreg.

Wide variations are found in the irrigation agriculture of the West, ranging from intensive cropping with nearly year-long irrigation seasons in the Imperial Valley of California to the occasional supplemental irrigations of the coastal and mountain areas of Washington. Crop adaptability is as varied as the soil and climatic conditions.

Availability of water is the limiting factor to increasing acres of irrigation agriculture in many parts of the West. There is generally more land capable of profitable production under irrigation than the water supply, under present use, will irrigate. One of the greatest opportunities for increasing production is through more efficient use of the water now available. From the watershed to the field, opportunities for conserving water are abundant. It has been estimated that for the 20,000,000 acres of crop and pasture land now irrigated in the United States, there is a 27-percent loss in conveying water to the

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land, and, after the water reaches the land, less than half of that water is effectively used. The place for solving the problem of water losses is, to a major extent, on the land where the water is applied.

Irrigation agriculture is just as dependent upon proper water use as it is upon proper land use to maintain a permanent agriculture. Water makes irrigation agriculture possible and man can generally control the water; therefore, he can have control over the agriculture.

MANY OF THE SOIL conservation districts formed in the Pacific coast region were established because farmers felt that their major land use problems were those of irrigation and drainage. Soil conservation districts are proving to be excellent organizations through which farmers and farmer groups can be brought together to solve mutual irrigation problems. There are more than a half million acres of irrigated land in 54 of the soil conservation districts of Pacific Coast Region 7—Washington, Idaho, Oregon, Nevada, and California.

Soil conservation districts in the West are attacking the difficulties of water use through cooperative action on community problems and by technical guidance to the individual farmers. Declining yields on irrigated acres result from several causes, mainly: infertility, erosion, alkali, water-logging, and weed infestation. District programs provide for correction or improvement of these conditions. Many solutions require group action and farmers are pooling their resources to rehabilitate ditches, put in drains, level the land, fight the weeds, and engage in numerous other activities that spell common success. Farmers are eagerly seeking technical guidance, not only in the improvement of the farm distribution systems, but also in adopting irrigation techniques which will improve the efficiency of water use.

THE USE OF CROPPING SYSTEMS to improve fertility makes possible a balance of high- and low-water requirement crops, thus extending the available water to the maximum acreage. The planning of cropping systems in accordance with the use capability of the land is often of even greater importance on irrigated lands than on nonirrigated lands, because of its direct correlation with efficient water use. In areas of the Pacific coast region where the water supply is from mountain streams, the supply diminishes during the irrigation season. To secure maximum use of the water, cropping systems can be planned which provide for decreasing water requirements as the season advances. A typical example is that of a farm in southeastern Idaho upon which the irrigated acreage was increased from 14 to 70 by taking advantage of the periodic water supply by months in planning the cropping program. Formerly the 14 acres had either received the total supply throughout the season or the excess water had been wasted. Early season cropping permitted beneficial use of all of the water and was also a benefit to the 14 acres which had previously been overirrigated.

Essential to conservation planning of improved irrigation practices is guidance regarding the proper time, rate, and amount of water applications. Farmers need to know the approximate water-holding capacities of their soils and the water requirements of the crops grown, so that irrigation may be timed for crop needs and water applied in amounts that will replenish the root zone depth of the soil with moisture to field capacity. It is common for farmers to irrigate irrespective of differences in soil or crop type. On-site demonstrations of testing water penetration with a soil auger have been most helpful in pointing out penetration rates and proper amounts of application. Irrigation education is aiding progress in getting away from "calendar" frequency of application and in the adoption of "crop need" frequency in its stead.

CONTROL OF IRRIGATION WATER is the key to proper irrigation. To obtain control, the farm distribution system must be fitted to the soils and topography so that the methods of application particularly suited to the soils and crops, may be employed. The spacing of head ditches to define lengths of run, devices for adjusting heads of water, positive division of water to fields, land leveling consistent with suitable methods of application, and efficient transportation of water are all mechanical aids designed to improve water distribution and to control erosion.

These aids are not the end point, but rather the tools with which to achieve high efficiencies of soil and water use. A large percentage of all lands under irrigation are insufficiently leveled to permit efficient water distribution. In most instances only light leveling is required greatly to improve the fields. Operations in nearly all soil conservation districts of the Pacific coast region include this practice. Many districts are purchasing land-leveling equipment and in others the Soil Conservation Service is making such equipment available. The texture and depth of soil is carefully considered in recommending leveling. In those instances where the soil is shallow and the use of the land is restricted, the distribution system is laid out to secure maximum results with a minimum of soil disturbance.

The conservationist or engineer working with the farmer in improving the farm distribution system can render an important service by employing the use capability of the land so that the system will permit the proper irrigation of those crops which are best adapted to the site conditions. Once the distribution system is corrected, the technique of water application can be altered to meet crop and seasonal variations. Simple controls which require no strategic war materials can be employed as labor-saving devices.

MANY EXAMPLES could be cited to show that better irrigation means more production and less labor. A few typical cases will illustrate this point. The system of irrigation on a 100-acre sugar beet field in southern Idaho was revised to secure better water distribution. Lengths of run of the irrigation furrows were reduced from 1,200 feet to 400 feet, and simple control devices were installed. One less irrigator was required as a result of this revision and the yield of beets was increased from 12 to 17 tons field average.

Better distribution of water with no increase in labor for irrigating resulted in an increase of one-half ton of hay per acre on a 40-acre field in the Kittitas Soil Conservation District in Washington, when runs were reduced from 1,320 feet to 330 feet and corrugations were effectively spaced.

By planning a seasonal balance between crops and water, a Nevada farmer found he could increase the acreage actually irrigated during the summer months by 24 acres. These 24 acres would raise the additional feed required for his dairy herd at no sacrifice of the other crops because he was to use that water which he had been wasting!

Many farmers in water-shortage areas of California have installed overnight storage reservoirs to provide more effective heads of water resulting in increased production and reduced labor. Scores of farmers have improved upon the method of water application as a result of technical assistance, for example: On the 190-acre citrus grove of the El Rancho Grande in Los Angeles County, Calif., irrigation and cultivation costs were reduced 40 percent primarily by the adoption of the broad furrow method of irrigation. Yields and quality of fruit have, at the same time, been materially improved.

Many farmers, however, are in the position of not being able to improve greatly upon their farm irrigation because the source of the water is not dependable. Such was the case with farmers living along Powder River in the Keating Soil Conservation District in Oregon. The supply canals were continually

The canals of the Southside Improvement District were in a deplorable condition in March 1943.

Wartime assistance to farmer groups assures water delivery. Shovel working on rehabilitation of Southside Improvement District canal shown in previous picture.

Misuse of land by poor cropping practices and uncontrolled water causes erosion and poor yields.

Simple control devices such as this canvas ditch-check help to conserve water.

breaking during the 1942 irrigation season, jeopardizing the crops on much of the 4,200 acres of cropland. Naturally, the farm operators were not in a position to adopt improved cropping systems or better use of water until they could depend on water delivery. At the request of the soil conservation district supervisors, the Soil Conservation Service made a reconnaissance survey of the entire distribution system on the south side of the Powder River, and investigated the status of water rights, organizations, and other pertinent matters. It was discovered that the main problems of the community irrigation systems were organizational and physical. The lack of a responsible water users' organization, with the consequent lack of maintenance, had resulted in a critical situation. Three unincorporated ditch companies had been attempting to operate overlapping distribution systems, but no cash assessments were levied (or could be collected, if levied), and maintenance was dependent upon contributions of labor. As the years passed, the canals became less operative, until in 1942 approximately 1,000 acres were without sufficient water to produce good crops, and a similar additional acreage was damaged as the result of canal breaks.

In September 1942 a meeting was called of all water users, at which time the organizational problems and the physical condition of the distribution system were discussed. As a result of this meeting, under the leadership of the soil conservation district technicians, the former ditch companies were abandoned, and a single water users' organization was perfected. This organization, known as the Southside Improvement District, incorporated under the laws of the State of Oregon, now has legal status to construct, operate, and maintain the community distribution system. Following the process of organization, a plan of rehabilitation for the entire system was developed by the soil conservation district, and a working agreement was executed by the two farmer groups.

The improvement district made an emergency assessment and collected the funds with which to finance the immediate rehabilitation program Under terms of the working agreement, the soil conservation district loaned, on a rental basis, several pieces of equipment to the improvement district, and furnished, free of charge a dragline rented from a railroad company. The immediate rehabilitation program provided for the realignment of canal sections, removal of high spots and accumulated silt and debris, strengthening and sloping of canal banks, and otherwise revising the canal cross-sections to the required hydraulic characteristics. Approximately 6 miles of improvement with a half-yard shovel, and 22 miles with a bulldozer and grader, were required immediately. Farmer labor and all materials were furnished by the improvement district.

Construction was started in March of this year, and a dependable supply of water was delivered by May 15. Following the 1943 irrigation season, the Southside Improvement District will continue the rehabilitation program. Specific maintenance provisions have been adopted which should provide for the continued functioning of this enterprise. As a result of this program, the farmers can produce at least 3,000 tons of alfalfa, or its equivalent, in 1943, which would not have been possible otherwise.

Additional increases in production will result as the farm operators adjust their cropping programs and practices to use the soil and water in the wartime service for which it is selected.

HUNDREDS of situations, similar in many respects to the example given above, may be found in the west. Education, organization, community action, and technical guidance available through soil conservation districts can work wonders for farmer groups as well as individuals. Conservation can be the irrigation farmers' solution to more production from every acre and every gallon of water!

Since the meeting of the Eighth Scientific Congress there has developed for the first time a consciousness in each of the South American countries that the problem of conservation is actually a continental problem. They are aware of the valuable lessons that they can obtain from the experience of the United States in its soil conservation program. Without doubt, the field of conservation is going to be one of the most vital fields for inter-American collaboration in the future.

The basis of this collaboration has been laid by the formation of the Pan American Soil Conservation Commission. The first meeting of the organization was held at the Pan American Union in Washington on September 3, 1942. At this meeting the delegates of the member countries elected Dr. Bennett chairman of the Commission, and empowered him to formulate, with the assistance of a small executive committee, a program of action. It is anticipated that this program will be an important segment of the total program of inter-American cooperation.—Ernest E. Maes, Secretary, The National Indian Institute.

Before this farm drainage ditch was dug in February 1943 on the John Yarmon farm in the Delta demonstration project, this land was frequently idle because of ponding.

DRAINAGE PUTS FERTILE DELTA LANDS TO WORK

By H. G. EDWARDS

POTENTIALLY FERTILE but poorly drained croplands assume increased importance in time of war. Such areas represent a large proportion of the good land available for expansion of farming operations.

Of the nine States in the Southeastern Region, Mississippi furnishes perhaps the outstanding example of what can be done by drainage to utilize fertile but idling lands. This State has approximately 2,778,000 acres requiring proper drainage for adequate crop production.

Drainage work is not new in Mississippi, the first drainage district having been organized under a law enacted in 1886. Nor is the upsurge of interest in drainage work during wartime limited to the present conflict. In the period of high agricultural prices after the first World War, organization of drainage districts and drainage operations boomed. With low farm prices later, much of the drainage work was allowed to deteriorate.

Although some 3,100,000 acres, or more than 10 percent of the total area of Mississippi in 1940 was assessed in organized drainage districts, most of the districts, like Topsy, just grew without any over-all program for coordinating the work. In the hill section of the State, as many as five or six districts would organize along one short stream. A district would be formed along the upper reaches of the stream and a ditch dug for a few miles. This ditch would concentrate water on lower areas and, as a result, another district would be organized and the ditch extended a few miles farther. This would be repeated several times. Frequently sand and silt washed from eroded hillsides would clog the ditches. Because of the lack of a coordinated program on a watershed basis, and the isolated nature of such developments, the damage to other lands was often considerable. Maintenance was woefully neglected.

Today the drainage program in Mississippi is being approached along sounder lines. Working through soil conservation districts, which provide a mechanism for coordinating activities, the Soil Conservation Service is providing technical assistance in the rehabilitation of existing drainage facilities, and is assisting other landowners in developing and maintaining community drainage projects.

Probably the most significant feature of the new program is the simultaneous attack on the drainage problem at both ends of the line. In the past, development of drainage consisted in providing the main drainage canals and lateral ditches, without any attempt to solve the drainage problem on individual

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farms. In soil conservation districts, development of an individual farm drainage plan becomes a consideration in developing the conservation plan. The development of complete conservation programs on the farms of the watershed provides a means of controlling erosion before the silt and sand washed from cultivated fields have contributed to the deterioration of the outlet system and created a serious maintenance problem.

The development of adequate drainage facilities, in conjunction with the conservation program on the land, is making available lowland areas for row crop production. This enables farmers to devote to perennial vegetation and other close-growing crops the steeper, more erodible areas, which in the past have been the source of most of the erosion debris which has clogged drainage channels. The steeper areas thus can be used for production of hay and supplemental grazing crops needed for increased production of milk and meat. This reflects sound land use, the fundamental basis of the soil conservation district program, and indicates the close affinity between conservation and drainage operations.

The first drainage work undertaken by the Soil Conservation Service anywhere in the Southeastern Region was in Coahoma County, in the Yazoo-Mississippi Delta. A CCC camp assigned to the Service was set up, with headquarters at Clarksdale, in April 1940, for rehabilitation of the primary drains in Coahoma and parts of surrounding counties. The work was limited to cooperation with legally organized drainage districts, and included repair, renovation, relocation, or reconstruction of existing drainage facilities.

Operations continued for a period of a little over 2 years, until all CCC camps were abolished on June 30, 1942. During the 2-year period, enrollees of the camp, under supervision of Soil Conservation Service technicians, rehabilitated 43⅓ miles of canals, including clearing, channel excavation, spoil bank leveling, establishment of permanent vegetation on ditch banks and slopes, and construction of adequate surface-water inlets for field drainage. The work benefited some 66,000 acres in Fishing Bayou, Hopson Bayou, New Africa, Sevier Lake, and Bush Outlet drainage districts, and Hopson Bayou subdistricts No. 1 and No. 2.

In May 1942, just prior to the conclusion of the camp operations, a 52,480-acre demonstration project of the Soil Conservation Service was set up in Coahoma and Quitman Counties, with headquarters at Clarksdale, to develop and demonstrate proper land use, adequate farm water disposal systems, erosion-control treatments, contour tillage, and other related soil-conserving practices adapted to the Delta. Work on privately owned farms within the demonstration area was limited to 10,000 acres.

Benefitting from good major drainage ways provided by the CCC camp work, the project is demonstrating the broader phases of conservation, including the development of farm drainage systems and conservation practices which will control erosion and prevent silting of major canals.

The organization of soil conversation districts in Mississippi has provided a means of extending drainage work of the Service to other areas of the State, both inside and outside of organized drainage districts. The 2,788,000 acres in Mississippi requiring drainage for adequate crop production, include 1,780,000 acres in organized drainage districts and 1,008,000 acres outside of drainage districts that can be drained at reasonable cost.

One of the most extensive drainage problems outside the Delta is in the Little Tallahatchie River watershed, comprising 1,560 square miles, which is coextensive with the Tallahatchie River soil conservation district. This area comprises some 700,000 acres of land in farms, in addition to extensive areas of Federal and State land. Private land under cultivation includes 128,000 acres of upland, and 122,000 acres of bottomland. Bottomland requiring drainage totals 102,322 acres.

This area presents an extreme example of the relationship between drainage and erosion control in the watershed. The history of the area is similar to that of many other areas in Mississippi and other parts of the South, except that conditions are more acute. The Tallahatchie River drainage district and a number of smaller drainage districts in the watershed were organized about 30 years ago, and much bottomland was brought under cultivation, but erosion debris has filled many of the drainage channels, and drainage is now poor. In many instances, farmers are being driven off their bottom-

Severely eroded areas of hill land, as seen in this aerial view, contribute sand and silt which clog drainage channels on lowlands. Development of adequate conservation program is an essential part of sound drainage strategy.

land and forced to farm steep, eroding lands which should be in permanent vegetation.

Preliminary drainage surveys and cost estimates have been made by the Soil Conservation Service in 22 organized drainage districts in the Tallahatchie River soil conservation district. Land-use capability classifications, flood and erosion control requirements have been evaluated in the United States Department of Agriculture's flood-control survey report on the Little Tallahatchie River.

Indicative of the local interest in drainage work in the Tallahatchie River soil conservation district, a group of farmers on Tippah Creek, in Tippah and Benton Counties, on their own initiative, secured a dragline and began operations as soon as the Soil Conservation Service began laying out the ditches. Work already completed has benefited 568 acres on 17 farms.

Approximately 8 miles of ditches are contemplated on this community project. By the time 5 miles of ditches had been laid out in Benton County, the dragline had completed work on the first 3 miles.

A more extensive community project in the Tallahatchie River soil conservation district is being developed by a larger group of interested landowners organized as the Upper Tallahatchie Citizens Soil Conservation Committee. This group plans drainage and other conservation operations on the Tallahatchie River in the vicinity of New Albany in Union, and parts of Tippah and Pontotoc Counties. This program is being pushed in cooperation with the soil conservation district.

In the Madison County soil conservation district a group of 13 landowners on Love Creek, with the assistance of the soil conservation district supervisors, obtained the use of a dragline which at the time was idle in Florida. At a cost of $4,100 they completed a canal draining 16.5 square miles of land which last December successfully handled a rain of 8 inches in 24 hours. The canal directly benefits 850 acres.

"My land is down near the mouth of the creek and I use this land principally for pasture, corn, and cotton," reports John H. Whitworth, a commissioner of the soil conservation district. "At one time I didn't consider this land safe for early crops,

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W. J. Waites takes a look at this vetch growing on his farm in the Holmes County Soil Conservation District. Mr. Waites has terraced all the cropland on his 1,000-acre farm, and has constructed adequate outlets to care for all the water from his fields.

but now I can go ahead with my farming operations early. Of course, the canal is new and we haven't had figures to prove anything yet, but I have been able to increase production of both crops and cattle as a result of the canal."

John S. Garland, another member of the group, says that on 20 acres of land that used to be too wet

Hereford cattle grazing on former marshland on farm of Dr. Gus Parr, Union County. After drainage, the 40 acres were seeded to white Dutch clover, Dallis and Bermuda grass, and lespedeza, providing good grazing for 30 head of cattle.

for corn, he made 40 bushels of corn to the acre last year. "I intend moving my pasture to the hill land and farming these bottomlands now," he adds.

A considerable amount of other drainage work has been done in Madison County, using a crawler type tractor and blade for construction. On the farms of Dr. W. B. Smith and H. H. Miller 1,600 acres have been benefited by two 3,000-foot ditches.

Four farmers along the west fork of Lewis Creek in Montgomery County have brought several hundred acres of fertile bottomland on their farms into production during the past 2 years through a community drainage program worked out with assistance of the Montgomery County soil conservation district.

Their problem involved the enlargement and realignment of the small creek, construction of ade-

H. L. Nichols, Montgomery County Soil Conservation District, expected to make 80 bushels of oats to the acre this year along this drainage ditch. District Conservationist L. A. Wilkins is examining the grain.

quate drainage ditches on individual farms, terracing of slopes bordering the bottomland, and construction of terrace outlet channels to control runoff water.

After a plan for carrying out these operations had been developed by the Soil Conservation Service, through the soil conservation district, the actual work was done by the farmers. These farmers cooperated in the use of a tractor and bulldozer rented

to carry out the heavier operations provided for in the community drainage plan for the four adjoining farms.

When work was begun on the B. Hester farm in the spring of 1941, water was flooding approximately 100 acres of the best bottomland with nearly every rain, J. W. Mann, tenant on the farm, reported. In 1939 15 acres of corn in the bottom produced 10 bushels per acre, and in 1940 16 acres were drowned out.

Proper sloping of banks on this drainage ditch is enabling King Callicutt, Union County farmer seen at the right, to plant every foot of this fertile lowland area to corn.

Even poorer results were obtained with cotton before the land was drained. Thirteen acres of cotton planted in 1939 produced only 2 bales and

This Negro family is living in what was formerly the loft of this tenant house. The house was partially buried when silt-clogged Abiaca Creek burst its banks and poured sand and other erosion debris over the surrounding lands.

Main drainage canal of Tippah River Drainage District No. 1 in the Tallahatchie River Soil Conservation District. The canal was cleared out in the fall of 1942 at a cost of $100 a mile.

Mr. Mann didn't even attempt a picking on 11 acres planted in 1940.

In 1941, immediately following the completion of the community drainage program, this farmer averaged 61 bushels of corn per acre on 30 acres in the bottom, with some of the land producing as

Plan Simpson, farmer, left, and W. L. Heard, Tallahatchie River district conservationist, inspect newly excavated farm lateral benefiting 150 acres on 5 farms in Tippah drainage district. Spoil bank at left will be levelled.

high as 80 bushels per acre. He got 19 bales of cotton on 22 acres.

In 1942 his corn yield was reduced to an average of 40 bushels to the acre, owing to the lack of nitrate of soda; even so, this was four times the 1939 yield, when plenty of soda was available.

Following drainage, 3 acres of bottomland in lespedeza and native grasses yielded 229 bales of hay,

weighing approximately 75 pounds each. The hay land was treated with a ton of lime and 333 pounds of superphosphate per acre.

"The draining of this bottomland will enable me to retire all of my rolling land to pasture and perennial legumes as fast as labor will permit," Mr. Mann said. "I consider the work done has increased the returns from this farm at least $600 a year, or the amount that I am paying for rent."

Henry V. Kent estimates that $165 expended for use of a tractor and bulldozer in carrying out the drainage plan on about 100 acres of affected land on his farm will be worth at least $500 a year. It enabled him to increase his corn production from 500 to 1,500 bushels and to convert to pasture 20 acres of land formerly used for row crops.

With the same equipment used by Mr. Kent, G. W. Suggett constructed a little more than a quarter of a mile of ditching on his farm at a cost of $70. He reports that his corn yields have more than doubled during the past 2 years and estimates that the drainage work will be worth at least $200 a year to him in increased crop yields.

T. W. Patterson, who had approximately 150 acres of bottomland on the west fork of Lewis Creek, reports that it was necessary for him to spend only $25 for work with the tractor and bulldozer and that the rest of it was done with mules and slip scrapes.

"I got at least $1,000 more for my crops in 1942 than I would have gotten otherwise," Mr. Patterson said.

A conservation survey of an area in need of drainage is a very important operation in the study of the problem. The Soil Conservation Service is now making a detailed conservation survey of Union County, which lies almost wholly within the Tallahatchie River Soil Conservation District, and of Tippah County, about half of which is in the district. A detailed reconnaissance survey is being made of Pontotoc County, which lies partially in the Tallahatchie River district.

The Yazoo-Mississippi Delta area where the first drainage operations of the Service were undertaken comprises approximately 4.2 million acres in northwest Mississippi. It includes all of 10 counties and parts of 9 others. The area is protected from direct floods from the Mississippi River by large levees that extend from the bluffs 20 miles south of Memphis, Tenn., to a point near the outlet of the Yazoo River, approximately 10 miles north of Vicksburg.

Before the AAA program went into effect, approximately 78 percent of the cropland was in cotton. As a result of this program, the cotton acreage was cut approximately in half. The proper treatment and utilization of the land removed from cotton production has constituted a major challenge.

Recently, corn, oats, soybeans, sorghum, rye, wheat, barley, alfalfa, and many other crops have been tried with marked success. Some areas have been made into permanent pasture. A great many grasses and legumes offer considerable promise. These include white Dutch, hop, red, and Persian clovers, along with several other species of native grasses and clovers.

The war demand for long staple cotton has emphasized the production of this type of fiber, which is especially adapted to Delta conditions. Improved cropping practices have increased acre yields and improvement of drainage facilities has reduced the hazard of crop losses.

The general conception of the Delta as a very fertile, flat valley floor with no particular soil and water problems, is only half the true picture. An erosion problem second only to the drainage problem exists on the "A" slopes, and these problems are inseparable. At points where farm drains empty into public drainage canals, silt bars often form as a result of soil erosion. The gradient of the canals is necessarily low, due to the topography of the land, and even small silt bars back water for several miles in the main canals. Many acres of fertile farm land are flooded as a result of backwater which will not allow the outlets from farm drains to function properly. These silt bars soon become thickly vegetated with willows and other undesirable plants.

Farmers in the Delta are rapidly coming to realize the value of proper drainage on individual farms in conjunction with sound conservation practices to control soil losses on cropland. They are finding that many areas heretofore not considered safe for crop production are being freed to do their part in the war program. E. F. Whittington, of Clarksdale, commissioner of the New Africa drainage district,

and a cooperator in the Delta demonstration project, expresses this point of view in regard to his own farm and nearby properties.

"As a result of drainage, the farmers are able to raise more feed and food than ever before, which is enabling them to meet the present demands," he declares. "Draining on my farm has been very effective, as far as it has gone, and I hope that we can complete drainage of my entire farm in the near future. These ditches are enabling me to use every acre of land and are absolutely essential for the production of crops on the heavy Delta soils.

"Clearing of undesirable vegetation from the canals and spreading and shaping of the canal banks has cut the maintenance costs to a minimum. Where drainage canals empty into rivers and bayous, these outlets have been protected with vegetation and are proving to be most successful and beneficial."

The cumulative value of acreages brought into production on many farms is indicated by L. J. Barksdale, another Delta demonstration project cooperator, who has brought into cultivation two fields, 40 and 60 acres in size, which were not considered safe for cultivation until improved drainage facilities were established.

"I'm not afraid to plant these two fields now, for water that used to give me fits can get off my land and into the canal and not hurt me," he explains. "With the need for more feed and food, these acres added to safe cultivation help me to raise more of what is badly needed now. I can count on every acre every year."

The preliminary work that was begun in the Delta by the CCC camp and is being rounded out by complete conservation programs on cooperating farms has been extended to other sections of the Delta through the soil conservation district program.

Excellent results, for example, have been obtained from a drainage terrace system on the J. H. Thomas farm, in the Holmes County soil conservation district. Five hundred acres on the Thomas farm have been drained and crop production has been made more uniform and materially increased.

District equipment has been used in the construction of V-type ditches on the Hugh Nichols farm, where 32 miles of ditches have been cut in draining 800 acres of "A" slope land An additional 200 acres is to be drained by drainage terrace construction.

On the 1,809 acres he is now working, Nichols used to have 200 acres of wet land planted in corn, oats, and soybeans "mainly to improve the looks of my farm." These were some of the most fertile acres on his farm, but they produced crops only during dry years—that was before Nichols constructed the first 26 miles of open ditches during the winter and spring of 1941, with district equipment, at a cost of approximately $700.

Before drainage Nichols produced 8 bushels of corn to the acre on this land; after drainage he produced 40 bushels. His per-acre yields of oats increased from 15 to 50 bushels. "The increased crops more than paid for the drainage construction the first year," he says. "The work has enabled me to get at least $5 an acre more for my crops, or $1,000 a year on the 200 acres affected by the drains."

The district equipment is now working on the Louis Lowentritt farm, where 58 miles of ditches are being cut and 2,000 acres, including 700 acres to be terraced, are to be drained.

To summarize drainage problems in the southeastern region—Many mistakes have stemmed from disregard for soil capabilities, and from failure to provide adequate drainage plans for individual farms. Detailed conservation and drainage surveys provide a sound basis for the development of wet lands. In numerous instances in the past, mistakes have involved inadequate outlet facilities, poorly designed or constructed systems, lack of maintenance, and the failure to control erosion on adjacent slopes. In many agricultural communities, farm drainage has been inadequate or impossible because of the failure to develop or improve outlet facilities by either private or public enterprise. .

The Soil Conservation Service has established in the southeastern region a method for evaluating the many factors that enter into the problem of drainage in relation to land use capabilities when watershed problems are involved. A regional committee has been set up for the purpose of investigating and passing on the merits of proposed undertakings. The first step is a reconnaissance of the area by a group of technicians, consisting usually of an engineer, a soils technician, and an agronomist. If drainage appears feasible and essential to the estab-

lishment of improved land use practices, a soil conservation survey is made, land use capabilities are determined, the economics of the problem are considered fully, and the justification for drainage improvement is established. By this means it is possible to determine the requirements necessary to establish the degree of drainage needed in all parts of the watershed. Critical areas that may require intensive soil conservation treatment against destructive erosion detrimental to the land within the area and to the contemplated drainage improvements are likewise determined.

The drainage survey, plan, and estimate of cost are then made. This plan, which takes into consideration the economics of the problem, is then coordinated with the rest of the farm conservation plans within the area. This makes it possible to plan an adequate drainage outlet system that will permit the design and establishment of supplemental drainage facilities and desirable land use practices on all of the farms in the community.

Simple drainage problems such as are found on one or more adjoining farms usually are solved, following a general conservation survey, by the local work unit technicians with the assistance of specialists from the regional office of the Soil Conservation Service.

Whatever part drainage development may be called upon to play in bringing into productive use fertile lowland areas—enabling the country to muster into war service vast new farmlands without resort to another "plow up"—the groundwork has been laid, and well laid, not only in Mississippi but also in many other States.

MANUFACTURING NITROGEN RIGHT IN THE ORCHARD

By JOHN T. BREGGER

IN THESE WAR DAYS of chemical shortages, it is important for farmers and orchardists to grow as much as possible of their nitrogen supply. The fruit grower, who often relies upon nitrogen from a purchased source in higher proportions than any other single fertilizing element, finds it imperative to make use of all the natural sources. The winter crop, when it is a strong growing legume, gives him this opportunity.

While the "winter cover crop" is often a misnomer, inasmuch as it does not always give winter protection from erosion, it may redeem itself to a large degree through spring growth, and perform as a valiant soil-builder at that time. When growing conditions in the fall are favorable, however, the fall and spring growth combine to furnish yields of organic material which constitutes a genuine fertilizing asset. As a source of new nitrogen this is significant enough, but one can also count as gain the leachable nitrates which are held and returned to the soil. In this realm, even the nonlegume can perform an important function.

EDITOR'S NOTE.—The author is project supervisor, Orchard Erosion Investigations, Soil Conservation Service, Clemson, S. C.

The August 1942 to May 1943 period has been one of the most ideal winter cover-crop seasons in the agricultural history of the Southeast. One leading agronomist has said that it has been the best winter cover-crop year since 1929. From the standpoint of present agricultural needs, the benefits derived have been enormous.

At the Orchard Erosion Investigations project having headquarters at Clemson, S. C., a comparison of promising winter and summer legumes has been made during the past 4 years. While much of this study has dealt with the soil and moisture conservation aspects of such cover crops, as affected by the various orchard soil-management practices, the soil-building factor has not been overlooked. Since the current season has been so ideal for the growth of winter species, a measure of the nitrogen added to the soil by utilizing such crops as plant food has been determined. Based on measured yields taken on representative areas of 4 square feet, computations were made of green-weight tonnage (whole plants) on an acreage basis, with adjustment for areas (about 20 percent) occupied by the orchard trees. Conversion to actual

Stubble mulch following spring tillage of cover crop in experimental peach orchard.

nitrogen and sodium nitrate equivalent were then made, using standard and laboratory-determined percentages. The data is summarized in the accompanying table.

From this data, it is evident that large quantities of nitrogen are added to the soil when a good growth of legume cover crop is incorporated. From experiment station reports it may be expected that an acre of hairy vetch will take on the average as much as 100 pounds of nitrogen from the air. If it is assumed that only half of this total amount will immediately become available to the trees, even that is equal to 50 pounds of nitrogen added as a commercial fertilizer, or 300 pounds of nitrate of soda.

The fertilizing value of a leguminous cover crop in terms of artificial fertilizers has long been emphasized. According to Bureau of Plant Industry workers, hairy vetch has been known to add as high as 202 pounds of pure nitrogen per acre. This is well over the amount supplied by a half-ton of sodium nitrate. When field crops follow such a legume, yields are often just as high as when additional nitrate of soda is also added. In fact, it has been demonstrated that where corn followed a good stand of Austrian winter peas, the additional application of sodium nitrate did not increase the corn yield a single bushel.

While a nonlegume cover crop will not add new nitrogen, its increased use, especially in mixtures, is to be encouraged for several reasons. In the first place it not only provides increased tonnage by its

Orchard Cover Crops—1943

Species or mixture	Green matter per acre in tons[1]	Computed pounds nitrogen per acre [2]	Equivalent in pounds $NaNO_3$
Green Stage (April 3)			
Rye	9. 8	90	564
Rye, Austrian winter peas, vetch	15. 3	252	1, 575
Rye grass and crimson clover	13. 9	89	557
Austrian winter peas	12. 3	143	892
Hairy vetch	9. 8	132	824
Crimson clover	14. 2	136	850
Button clover	15. 3	151	945
Southern spotted bur clover	7. 1	116	728
Blooming Stage (April 29)			
Button clover	19. 1	230	1, 440
Southern spotted bur clover	8. 7	143	892

[1] Based on 80 percent coverage (orchard conditions).
[2] Based in most cases on analyses in Morrison's "Feeds and Feeding" (Last Edition).

own weight, but it affords support to the legume plants so that they, too, will make more growth as a result of more efficient exposure to sunshine. Of equal importance is the carbonaceous material supplied by a nonlegume, which prolongs the period of decay, thus making a large supply of the nitrogen available over a longer period of time. Winter erosion losses are cut down as a result of increased ground cover, and subsequent summer erosion is reduced through formation of a fibrous root system. In addition, a good mulch residue is provided. A single rain can remove as much nitrogen and organic matter as the amount added to the soil by a good cover crop; this would seem to put high value on the nitrogen held in the organic material of a good growth of nonlegume plants.

Harvesting the winter cover crop for the benefit of an orchard is not the same kind of proposition that faces a general farmer when he turns under such a crop for the benefit of the crop which follows a few weeks later. In an orchard the cover crop occupies the land up to or during the very time fruit trees need their maximum supply of plant food. This creates a problem in timing the cultivation, and also dictates the method of tillage. If, for instance, an over matured nonlegume is involved, the orthodox type of "turning under" will often bring about nitrogen starvation in the trees. Thus, a "trashy" type of cultivation now called "plant mulch tillage" takes an important role in the orchard soil management program.

In evaluating a winter legume cover crop for orchard use, there are several factors to consider. Not only is yield or tonnage an important item, but also the period in the spring when the plants reach maturity. While larger cover crop yields could be produced, especially in a young orchard, if spring cultivation were to be delayed, this is not always in keeping with recommended practices. In the table shown here bur, button, and crimson clovers made fairly close approaches to maximum yields at the earlier cultivation date. Southern spotted bur clover, near the northern end of its growing range, gave the lowest relative yield.

While it is rarely possible to leave a cover crop to complete its growth without sacrificing tree growth and fruit production, there are modifications and exceptions to this general rule. The most important modification consists of practicing alternate middle or strip cultivation: This allows the cover crop to complete its growth and produce seed on a portion of the orchard area. During spring seasons of above-average rainfall the cover crop may also be left for a longer period, provided sufficient extra nitrogen is supplied to prevent a shortage for the fruit trees. Moreover, as in the case of an early-maturing legume species such as spotted bur clover, the danger from leaving the stand uncultivated is further minimized.

NEW CONSTRUCTION PRINCIPLES FOR FARM FISH PONDS

By VERNE E. DAVISON AND JOHN R. CARREKER

FARM FISH PONDS are becoming increasingly popular. On many farms, sites are available where the development of such a pond represents the best use of the land. Ordinarily fish can be caught from properly constructed and stocked ponds within a year, and the ponds provide a source of both pleasure and food for the farmer, his wife, and children.

Hundreds of ponds are being built for stock watering as livestock farming increases in the Southeast. Fish can be produced in these ponds as a byproduct if a little attention is given to improved features of construction.

New construction features designed to increase fish yield, reduce cost of maintenance, and lengthen the life of ponds, have been developed recently at the Southern Piedmont Experiment Station at Watkinsville, Ga.

Most important of these is the reduction of shallow-water areas in the upper reaches of impounded ponds. Although deepening near the dam to obtain soil for construction has been a common practice, the remaining areas of shallow water, formerly believed desirable, have been given little attention.

The fact is now well established that waters less than 2 feet deep are of little or no value for fish, but present, on the other hand, several problems of maintenance. Work at the Southern Piedmont Station has developed a simple method of reducing the amount of shallow water.

The second principle of better pond construction involves the use of a drain pipe through the bottom of the dam as a trickle spillway. This is inexpensive, and safer that the vegetative spillway, which sometimes fails, owing to saturation by continual overflow.

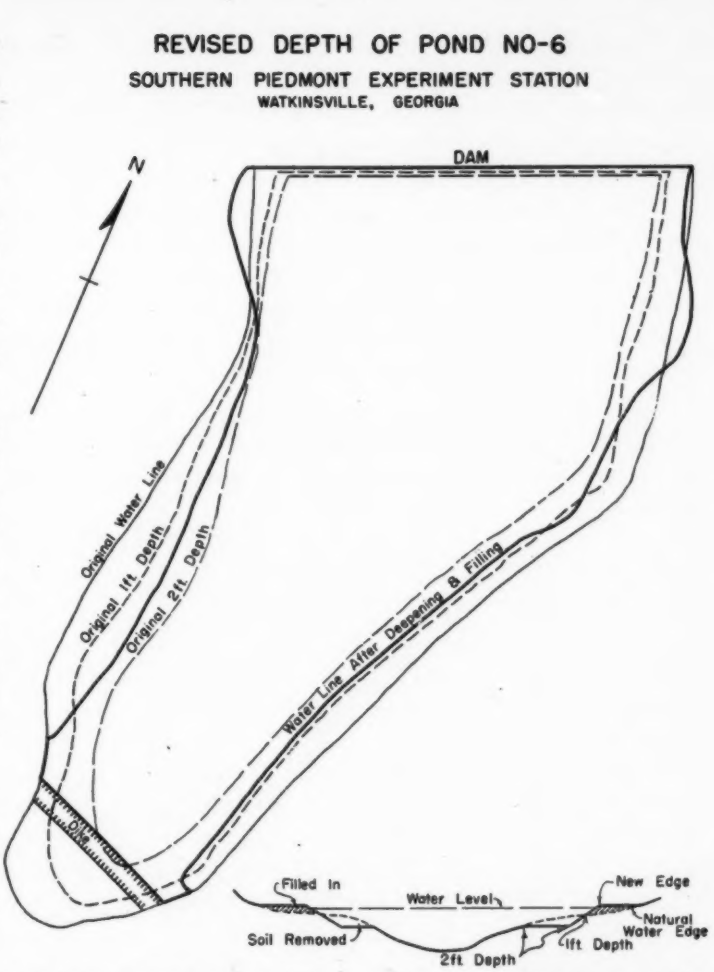
EDITOR'S NOTE.—The authors are chief, regional biology division, Soil Conservation Service, Spartanburg, S. C., and associate agricultural engineer, Southern Piedmont Conservation Experiment Station, Watkinsville, Ga., respectively.

The objectives of deepening the edges of a pond are (1) to control water weeds, mosquitoes, and the number of small fish more effectively, (2) to reduce the area of evaporation, (3) to prevent unnecessary muddying and destruction of spawning beds by livestock, and (4) to increase the areas of good fishing from the banks. Weeds that grow at the edge can then be reached and easily removed. Mosquito larvae can be controlled by fish. Bass are better able to feed on small fish, reducing their numbers so that a higher percentage of the total weight of fish in the pond is of usable size. The entire edge becomes suitable for both bream and bass fishing after deepening, whereas ordinary construction leaves only the end near the dam favorable to fishing. The surface area is reduced by the deepening process, and evaporation is limited proportionately, yet waters productive of fish are increased.

Deepening is done by filling in the edge where water is to be less than 1 foot deep with soil removed from adjacent areas which would otherwise be only 1 to 2 feet deep. To accomplish this operation, three contours are staked, one at the natural water level, a second at the 1-foot depth, and the third at the 2-foot depth. The strip between the 1- and 2-foot depths is then plowed and the soil scooped from it and moved to the shallower section. This brings the new edge to approximately the 1-foot line, but need not be exactly so. Smooth-curving lines should be left for pleasing appearance.

Diking off the shallow water at the upper end of a pond, rather than filling, is more satisfactory for a very gentle slope like that usually encountered at the shallow upper end. The dike must be raised a foot or so above the normal water level so that runoff water will enter the pond around both ends. Soil for the dike is taken from the pond basin just below it, further deepening it.

The accompanying drawing of Pond No. 6 at the Watkinsville, Ga., station shows how the areas



This sketch shows how to reduce evaporation, avoid maintenance troubles, and increase fish production by reshaping the shallow edges of a pond.

of shallow water may be reduced. Without alteration the surface area would have been 1.63 acres, ranging in depth from 0 to 10 feet. The relation of shallow areas to the whole pond would have been as follows:

1.14 acre (70 percent)—2 feet or deeper.
0.23 acre (14 percent)—1 to 2 feet deep.
0.26 acre (16 percent)—Less than 1 foot deep.

The 30 percent of pond area less than 2 feet deep is undesirable. Thus only 70 percent would have been good. As a result of deepening, filling, and diking the following changes are effected:

1.37 acres (a reduction of 16 percent), surface area.
1.25 acres (91 percent) 2 feet or deeper.
0.12 acre (9 percent) less than 2 feet deep.

No material change was made in the acre-feet of

water. The 9 percent is the narrow area in the 2½ to 1 bank slope around the entire pond. Experience may show that a 3-foot depth is feasible for dry-land ponds to avoid extreme fluctuations in the size of the surface area due to evaporation.

The use of a drain pipe as a trickle spillway is accomplished by connecting it to a tipping pipe or a stand pipe that is brought to the pond surface elevation. Vegetated spillways are most economical for farm ponds but, as has been pointed out, they sometimes fail due to the constant saturation of the spillway by continual even though small overflows. By cutting the stand pipe off 4 to 6 inches below the spillway level, all of the normal flow and most of the runoff water that enters the pond is carried through the drain pipe, thus permitting the use of these inexpensive spillways.

EDITOR'S NOTE.—A new Farmers' Bulletin, "Fish for Food From Farm Ponds," discusses these two features of construction as well as other important steps in selecting sites, building dams, protecting against erosion, stocking properly, and managing wisely.

PASTURE FARMING MAKES 265 POUNDS BEEF PER ACRE

By DWIGHT D. SMITH

CUTTING THE LABOR COST to less than one-eighth, bringing erosion down to one-third or less, selling less of the soil fertility off the farm in the crop, yet producing more per acre, is essentially what is being accomplished by the soil-conserving pasture system of farming.

An average of 265 pounds of beef per acre was produced per season on the wheat-lespedeza grazing areas at the cooperative Soil Conservation Experiment Farm at McCredie, Mo., where measurements of erosion from pasture systems of farming are being made. This has been the top producing system of the five which are being studied. The equivalent in corn production of the 265 pounds of beef is 41 bushels per acre. This is more than the average corn yield in the corn-oats rotation. It is the highest corn-yield equivalent of all the five areas under measurement on which the crops are partially or all grazed out.

Good quality yearling Hereford steers and heifers have been used for the grazing trials. They were turned on the wheat about the third week in April, and grazed there until about June 15, when the wheat was gone. They were returned to the area about July 1 for the grazing of the lespedeza, and remained there until about October 1, when the area was disked and drilled to wheat. By this system, neither labor nor farm machinery is used on the areas except in the fall, when the weather, as well as the supply of farm labor, is generally more favorable for field work than the spring and early summer. The lespedeza has reseeded itself each year after the original seeding. Agricultural lime at 3 tons per acre was applied at the beginning of the experiment, and 100 pounds per acre of 0–20–10 fertilizer is applied each fall when the wheat is drilled.

This cropping system, with the soil treatment, has provided good erosion control. The soil loss has been only 27 percent of that from the corn-oats system, and 57 percent of that from a corn-oats-meadow system. The wheat-lespedeza combination has given better erosion control than any of the common cropping systems except continuous grass. This is because it provides a growth of surface cover throughout most of the year, particularly during the season of heavy rainfall. Ordinary disking of the lespedeza in the fall mixes the stubble with the soil without complete covering. A field cultivator would do even a better job. Thus, some protection against erosion is provided during the period in which wheat is developing. During the summer the thick foliage of the lespedeza prevents rain from beating on the soil, and the sturdy stems form barriers to runoff water. Wheat provides protection during the spring. On sloping land, however, contouring, and generally terraces, are necessary supporting practices for ideal erosion control.

Timothy-lespedeza and timothy-sweetclover-lespe-

EDITOR'S NOTE.—The author is project supervisor, Soil Conservation Experiment Stations, Columbia, Missouri.

deza are other pasture systems that give even better erosion control than wheat-lespedeza, and required no labor, power, or machinery, except when started or renewed. These are systems that do not require supporting practices for control of erosion when once established, and when the waterways are covered with grass. The beef production by these two systems has been at the same figure to date, but was only 85 percent of that from wheat-lespedeza. It has averaged 225 pounds per acre, or an equivalent in corn production of 35 bushels per acre. These systems have given almost perfect control of erosion, and the area with the sweetclover has had an extremely low loss of rainfall as runoff. The soil in both these systems has been limed, and it received 0–20–10 fertilizer when the systems were established. They have not had the annual applications of phosphate and potash that were used in the wheat-lespedeza, but they will receive 0–20–10 fertilizer at intervals of about 2 years in the future. The production and measured erosion losses from several of the systems under investigation on gently rolling Putnam silt loam soil are given in the accompanying table.

These pasture systems meet the requirements of ideal farming plans for a large acreage of rolling lands, particularly those of medium to low fertility. They provide fertility maintenance, since commercial fertilizers are periodically applied and manure is left on the land by the grazing animals. Adequate erosion control may be had with these pasture systems by the use of the less expensive supporting practices, because of the natural erosion-resisting qualities of the systems. The use of labor, power, and machinery in crop production is reduced to a minimum. The returns in production are at least equal to, and in most cases increased over, those of other systems of farming. This is a fortunate combination of more intensive production and profitable return on labor, all with a high degree of conservation of both the fertility and the body of the soil. It is a case in which soil is being conserved and yet pays big dividends.

Beef production and erosion from pasture systems of farming, compared with the older systems

System	Percent of rainfall lost as runoff	Soil loss in years required to remove the surface 7 inches	Production per acre		
			Pounds beef	Animal days	Corn equivalent
Wheat-lespedeza	34	300	265	170	41
Timothy-lespedeza	29	2,300	224	154	35
Timothy-sweet clover-lespedeza	24	1,600	226	175	35
Corn-oats-meadow	28	170			30
Corn-oats	38	80			24

Data from Putnam silt loam plots of 3 percent slope. Average annual rainfall for the 2-year period of erosion losses was 47.9 inches. Production figures are a 3-year average. Soil treatments of lime and 0-20-10 fertilizer were used on all plots except those of the corn-oats rotation.

GOOD NEIGHBORS

By WILLIAM X. HULL

BY A TRANSFER of funds from the office of the Coordinator of Inter-American Affairs to the Soil Conservation Service, and the cooperation of the Foreign Service of the State Department, it was made possible to bring to the United States last fall 25 Latin-American technicians for a year's study of the methods and practices used in our Service for conserving soil and moisture and controlling erosion.

The Foreign Service of the State Department worked with the Department of Agriculture of the various countries in selecting candidates for this study. Final selection was made by the Soil Conservation Service. The various embassies obtained transportation for each successful candidate and started him on his way to this country. The farthest traveler came from almost the very southernmost tip of South America while the closest arrived from our nearest island neighbor, Cuba. Here is the group, with the countries from which they come—

Jose Salvador Jauregui	El Salvador.
Anthony Lespes	Haiti.
Ricardo Alberto Leon	Mexico.
Javier Garcia Paredes	"
Emilio Zamudio	"
Humberto Ortega	"
Gonzalo Pedro Andrade	"
Manuel T. Rodriguez	Chili.
Jose Antonio Rugeles	Venezuela.
Alfredo Gustale Antonelli	Paraguay.
Gonzale Alfonso Moreno	Ecuador.
Lucio Garcia-Vasquez	Cuba.
Rodrigo Gonzalo Orellana	Ecuador.
Jose Orlando Suarez	Chile.

EDITOR'S NOTE.—The author is Latin American assistant, Soil Conservation Service, Washington, D. C.

Arturo Somoza	Argentina.
Paulo Parisio de Melo	Brazil.
Silvino Alqueres Batista	"
Ricardo Jahn Adoue	Venezuela.
Luis Arturo Fernandez	Costa Rica.
Jador Torres de Rezende	Brazil.
Carlos A. Fynn	Uruguay.
Fernando Sayan-Palacios	Peru.
Mario Augusto Baracco	"
Sebastian Anibal Romero	Venezuela.
Casiano Victor Quevedo	Argentina.

In the limited time of 1 year the best way to *learn* is by *doing*. Therefore, each man, after a short stay in Washington, was sent to some soil conservation district work unit. Here he became an integral part of the field staff, taking part in all the activities of the work unit. At the same time he was coached by our technicians. He was required to read and study texts and bulletins. He was encouraged to ask questions. He was made familiar with the techniques of agronomic, forestry, engineering, range, and wildlife practices. He put these practices to use in planning a farm or ranch.

Each student-guest became a member of a soil survey group and here learned the technique of soil surveys, conservation surveys, the making of land capability maps and tables—red land, green land, yellow land—and how to apply these capabilities to the farm plan and the farmer's individual problems. He visited and studied the work of our experiment stations.

One trainee writes:

"The Soil Conservation Service is doing its best to bring clearly out of the trainees the different aspects of soil and water conservation problem. But it is also the task of the trainees to do the best they can to make easier the help of the Soil Conservation Service. These boys know better than anyone else what point of the program is of a peculiar interest to them. Then, they have not to hesitate to ask any information on such a point.

"On the other hand, the attention of the trainees might be called upon the fact that the rules and technics of the Soil Conservation Service of the United States are not rigid standards for the Latin-American countries. Many of the technics involved may be understood as a starting basis for further investigation and researches on special problems, which can only be solved by appropriate means and methods. Besides, soil conservation is not only a matter of technics; it also implies a social and economic aspect *much more acute* in Latin-American countries than in the United States. It should be useful to point out this fact so the trainees could not be induced into some possible errors."

While carrying on these various studies, the trainee sends home many suggestions for adapting our practices to problems in his own country.

Because we cannot, in the United States, find locations where climate, rainfall, topography, and agronomic conditions coincide exactly with those of his home country, we try to locate the trainee where we believe practices are carried out that may easily be adapted to conditions at home.

During the last 4 months of each man's training and study, he is moved to various other parts of the country to broaden his understanding of conditions and practices.

Three languages are represented. The native language of those from Brazil is Portuguese; those from the Island of Haiti speak French; the rest converse normally in Spanish. All of the men were able to read English and most of them could talk it to some extent. But even when first mingling with our people they experienced little difficulty in getting along. There is a universal language the world around—that of signs, of pictures, and of diagrams that helps immeasurably. Yes, even to learning to jitterbug! One young man wrote me, "I am learning your very athletic dance, the jitterbug."

That these men appreciate the opportunity that has been afforded them to visit our country and to learn the principles and practices of soil conservation is expressed in their every action, and particularly in the way they apply themselves. At the same time our own men have learned many things about South and Central America that they never knew before.

To say that these men are one of the factors in our good neighbor policy is putting it mildly. They are themselves good neighbors. When they return to their home countries, their peoples will be shown that the "good neighbor policy" is little more than instilling in each of us—whether from the United States of North America, from West India or from a Latin American republic—that we are all "American."

Next year we are to have another group of 25 technicians from our good neighbors to the South. These will undoubtedly profit from the experience we have had in teaching—and learning from—the pioneer trainees now with us.

KEEPING IN TOUCH

Division chiefs of SCS regularly write letters to former employees now in the Army and Navy, telling the things they want to hear about their jobs and their former associations.

EMPLOYEES FIGHT WAR WITH DOLLARS

ON MAY 4 the Soil Conservation Service was publicly acclaimed in the Department of Agriculture auditorium because of the fine record of its employees in financial support of the war. Recognition came in the form of a War Savings Bond Flag and an Honor List Certificate awarded by the Department of the Treasury.

Soil Conservation Service was the first large group in the Department to reach the twin goals of 90-per-cent-or-better employee participation with at least 10 percent of the pay roll invested through the pay roll savings plan.

Grover B. Hill, Assistant Secretary of Agriculture, was master of ceremonies. T. Roy Reid, director of personnel, received the awards on behalf of the Department from E. F. Bartelt, acting chairman of the Interdepartmental War Savings Bond Committee. H. H. Bennett, Soil Conservation Service chief, proudly accepted the flag and certificate for the 7,470 employees—and shortly thereafter placed the trophies on display near his office on the fourth floor of South Biulding.

Mr. Bartelt remarked that "It is especially fitting that the Soil Conservation Service, which by its provident foresight has made such a valuable contribution to the vital wartime food supply of our Nation, should again be in the forefront of another essential part of our war economy."

The presentation in the Department of Agriculture Auditorium. Left to right: Grover B. Hill, Assistant Secretary of Agriculture; H. H. Bennett, Chief of the Soil Conservation Service; C. C. Craver, Jr., Treasury Department; Henry Herrell, Office of Budget and Finance, Department of Agriculture; T. Roy Reid, Director of Personnel, Department of Agriculture; John S. Fickling, SCS Chairman of Payroll Savings Plan; E. F. Bartelt, Acting Chairman, Interdepartmental War Savings Bond Committee, and Charles Mead, Treasury Department.

April recapitulation showed that 91.2 percent of employees in Washington and the field were investigating 10.6 percent of the total pay roll in War Savings Bonds under the pay-roll savings plan. Of those employed in the Capital, 84.7 percent were investing 9.1 percent of the total pay roll. Of employees carried on the field pay rolls, including Beltsville, 91.6 percent were earmarking 10.7 percent of their combined pay rolls for War Savings Bond deductions.

Among the 29 major agencies in Washington, the Service is in a two-member tie for fourteenth place, and of the 22 Government bureaus operating in the field it is in a two-place tie for fourth.

Chief Bennett has personally commended the employees of the Budget and Finance Division, Pacific coast region, for having achieved the highest record of all our offices having 10 or more employees, in purchases made under the pay-roll savings plan during the month of April.—*John S. Fickling.*

ONE MORE HOUR TOWARD VICTORY

ON MAY 31—the Monday following Memorial Sunday—offices of the Soil Conservation Service opened an hour earlier than usual, and closed an hour later. This was to accommodate the large number of employees who volunteered to work an extra hour in honor of the men who have died in the service of their country. SCS received widespread newspaper attention in Washington as the first major agency to adopt this form of commemoration. The extra hour was optional with each employee, and was worked at either the beginning or the end of the regular period.

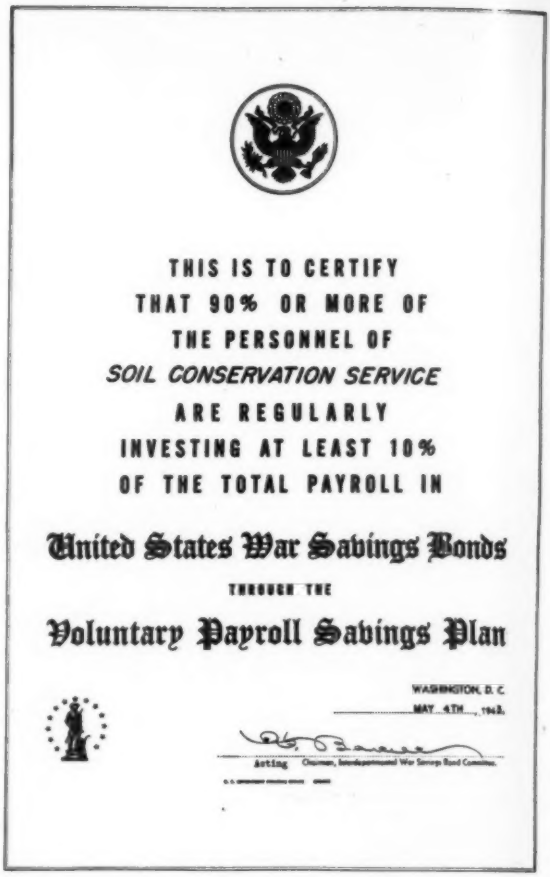
In commenting on the observance, Dr. Bennett said, "The amount of time is small, but to me it symbolizes a much larger feeling of our debt to the men who have given everything within their power to give, that America and our American way of life may be preserved."

EVER HEAR OF A METAL "DOODLE BUG"?

The idea pot is bubbling merrily.

Numerous suggestions are spattering into Washington and the regional offices from employees whose minds are occupied with efficiency-making thoughts that deserve sharing.

From C. O. Ferguson, work unit leader of the Navarro-Hill Soil Conservation District down in Texas, comes a summary of seven "practices now in operation and suggestions for work improvement"—not all of which, he points out, are "original."



Among other things, Ferguson favors an "E" for outstanding district cooperators who are increasing production for war needs. He notes, too, the usefulness of vocational agriculture classes in the sodding of terrace outlets and pastures, and infers that such classes might be recruited for other needed labor. He points also to the adaptation of district work plans as supplementary school texts in Limestone County.

One of Ferguson's most practical suggestions has to do with an instrument dubbed the "doodle bug." The device is easily made from a welding rod. It is pronged at one end, the points of each prong being one-fourth inch apart; this width is equivalent to 10 rods on an aerial photograph. The doodle bug is "walked" along a fence or terrace to measure its length.

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For REFERENCE

Compiled by ETTA G. ROGERS, Publications Unit

Field offices should submit requests on Form SCS–37, in accordance with the instructions on the reverse side of the form. Others should address the office of issue.

SOIL CONSERVATION SERVICE

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